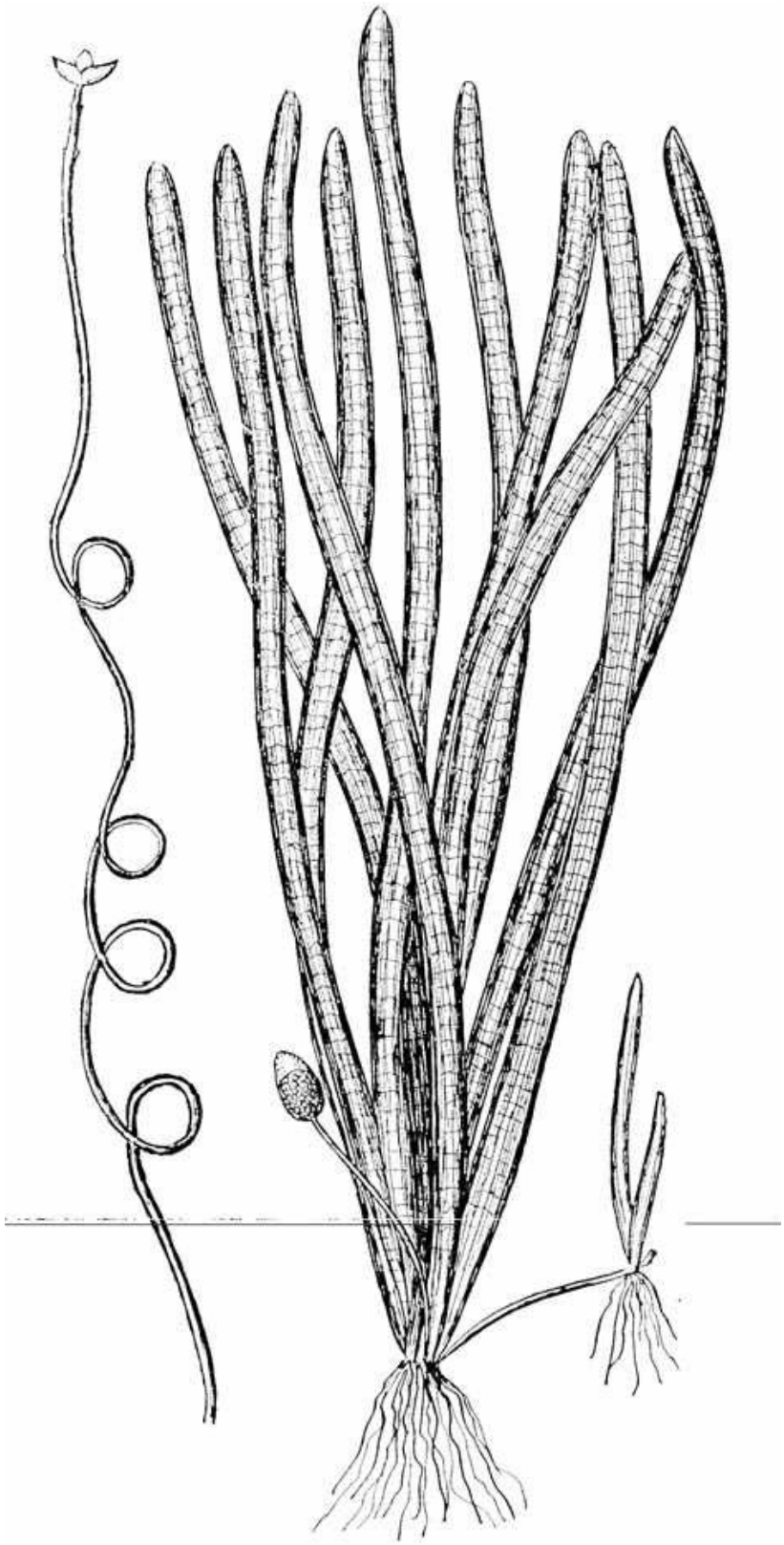
Vallisneria americana



Vallisneria americana Fact Sheet

Description:

Often referred to as wild celery, tapegrass, or freshwater eelgrass, but not related to edible garden celery, *Vallisneria americana* is a **dioecious** freshwater **perennial** plant having **fibrous** roots. *V. americana* has linear **submerged** or floating leaves that are strap- or tape-shaped and may extend 2 meters or more depending on water depth. The long, flattened, ribbon-like leaves all emerge from the base of the plant in clusters. The leaves are microscopically **serrulate**, with a bluntly rounded tip. A characteristic light green stripe runs down the center of the finely veined leaves. This is most visible when the leaf is held up in the light. Plants grow from nodes along the creeping underground **rhizome** from which fibrous roots extend. Leaves are approximately 1 cm wide. *Vallisneria americana* flowers from July through September. Another SAV, eelgrass, can sometimes be confused with wild celery. However, eelgrass has **alternately** arranged leaves and, because of its preference for high salinity areas, the two species are rarely found in the same location. It belongs to the Hydrocharitaceae family, Hydrocharitales order, Alismatidae subclass, and Monocots class, and the Tracheophyta phylum. The Hydrocharitaceae family (the Tape-grass family) also includes elodea, hydrilla and eel-grass.

Distribution:

Vallisneria americana is found primarily in eastern North America, occurring west from Nova Scotia to South Dakota and south to the Gulf of Mexico. It has recently been reported in the western States of Washington, Nebraska, New Mexico, and Arizona. It is a bay grass that is widely distributed in fresh water, tidal freshwater rivers and tidal tributaries of the Chesapeake Bay. It has been found in both **lentic** and **lotic** evironments.

Reproduction:

Vallisneria americana reproduces by seed, rhizome, and tuber and is therefore capable of both sexual and asexual reproduction.

Sexual:

The **pistillate** flower is located on a flower stalk that grows by cell elongation to carry the flower to the water surface for pollination in late summer. The **pistillate** flowers have 3 **sepals** and three white petals. The **staminate** flowers are crowded together and enclosed in an **ovoid** **spathe** on a short **peduncle** at the base of the plants. Each **spathe** consists of about 2,000 male flowers. Upon maturity, the male flowers break free and float to the water surface. Wind and water currents on the surface help spread about the

male flowers where they may come into contact with the female flowers. Once fertilization is complete the **peduncle** of the **pistillate** flower coils up and draws the developing fruit underwater. A long, cylindrical pod is produced that contains many small, dark seeds. In late summer or early fall, some of the fruit capsules rupture and release a gelatinous matrix containing sees. This mass settles to the bottom in close proximity to the parent plant. Other fruits do not rupture until the plants have broken free of the substrate and floated away, thereby providing a dispersal mechanism.

Asexual:

In late spring, shoots of *Vallisneria americana* emerge from over-wintering buds by **stolons** that form a compact **rosette** of ribbon-like leaves that is carried to the sediment surface, much like strawberry plants will produce "runners". One winter bud may produce as many as 20 rosettes during a growing season. The ribbon-like leaves usually reach the water surface in early to midsummer. In late summer, rosette production ceases and some rosettes develop one or more winter buds on **stolons** that grow down into the sediment. After winter bud formation, the remaining stem tissue degenerates, breaks free of the substrate, and floats until it decomposes.

Importance:

It is one of the most important SAV species of the Chesapeake Bay because of its food value for waterfowl, particularly the canvasback duck (*Aythya valisineria*) whose name is derived from *Vallisneria americana*. All parts of the plant are important food items for many species of waterbirds. Roots, **rhizomes** and **stolons** help to reduce erosion and facilitate colonization by **benthic** algae and **invertebrates**; their foliage offers shelter, support and a locally enriched oxygen supply. *Vallisneria americana* is also a source of food for an immense variety of **aquatic invertebrates** and fishes, and for birds and mammals that frequent aquatic habitats. *V. americana* also acts as a nutrient buffer by using dissolved nitrogen and phosphorus for growth, thus making these nutrients unavailable for use by algae.

VOCABULARY:

Algae – aquatic nonvascular plant-like protists with chlorophyll often masked by a brown or red pigment

Alternately – arranged first on one side and then on the other at different levels or points along an axial line

Benthic – living on the ocean floor

Dioecious – male and female flowers occurring on separate plants

Fibrous – composed of or resembling fibers

Invertebrates – animals lacking a spinal column or backbone

Lentic - where there is no continuous flow of water, as in ponds, lakes.

Lotic - where there is continuous flow of water, as in streams, rivers.

Macrophytes – macroscopic plant life

Ovoid – solid, with an egg-shape

Peduncle – flower stalk

Perennial – a plant living more that two years

Pistillate – containing pistils (seed-bearing organ of a flower)

Rhizome – lower horizontal stems either prostrate on sediment surface or buried; usually with roots and new shoots at stem nodes and curving upward at the ends

Rosette – circular cluster of leaves or other structures

Sepals – the outer leaves of a flower

Serrulate – finely toothed

Spathe – a large bract enclosing a flower or group of flowers

Staminate – containing stamens (pollen-bearing organ of a flower)

Stolons – a horizontal branch from the base of a plant that produces new plants from buds at its tip or nodes; called also a runner

Submerged – underwater

Submerged Aquatic Vegetation (SAV) – underwater bay grasses

Vallisneria americana Questions from Fact Sheet Reading

1. Does each *Vallisneria americana* plant live for just one year, two years, or longer?
2. Where are these plants found? On land, in water, etc..
3. Describe the shape of the leaves, including the edges.
4. What are the two main differences between wild celery and eelgrass?
5. Fill in the blanks:

   Wild Celery:

   Kingdom - _____

   Phylum – *Traceophyta*

   Class - _____

   Subclass – *Alsimatidae*

   Order – *Hydrochitales*

   Family – *Hydrocharitaceae*

   Genus - _____

   Species - _____

6. What type of water (fresh or salt) does wild celery prefer?
7. In an experimental situation of growing *Vallisneria americana*, a large 10 gallon tub, should the water be still or moving? Support your answer with facts from the Fact Sheet.
8. How does the pollen reach the pistillate flowers?
9. *Vallisneria americana* asexually reproduces by "runners". What land plant also reproduces this way?

10. *Vallisneria americana* is a very important SAV species. List 3 reasons why.

ANSWER KEY: *Vallisneria americana*

Questions from Fact Sheet Reading

1. Does each *Vallisneria americana* plant live for just one year, two years, or longer?
   It is a perennial, longer than 2 years
2. Where are these plants found? On land, in water, etc.
   Underwater
3. Describe the shape of the leaves, including the edges.
   Leaves are flattened, ribbon-like, finely toothed if viewed through a microscope
4. What are the two main differences between wild celery and eelgrass?
   Eelgrass has alternately arranged leaves and prefers high salinity.
5. Fill in the blanks:
   Wild Celery:
   Kingdom - ***Plantae***
   Phylum – *Traceophyta*
   Class - ***Monocotoledonae***
   Subclass – *Alsimatidae*
   Order – *Hydrochitales*
   Family – *Hydrocharitaceae*
   Genus - ***Vallisneria***
   Species - ***americana***
6. What type of water (fresh or salt) does wild celery prefer?
   fresh
7. In an experimental situation of growing *Vallisneria americana*, a large 10 gallon tub, should the water be still or moving? Support your answer with facts from the Fact Sheet.
   Wild celery is found in lentic (no continuous flow of water – ponds or lakes) and lotic (continuous flow of water – streams and rivers) environments
8. How does the pollen reach the pistillate flowers?
   The male flowers break free and float to the water surface. Wind and water currents on the surface help spread about the male flowers where they may come into contact with the female flowers.
9. *Vallisneria americana* asexually reproduces by "runners". What land plant also reproduces this way?
   Strawberry plants
10. *Vallisneria americana* is a very important SAV species. List 3 reasons why.
    - **Food for waterfowl, aquatic invertebrates, fish, some mammals**
    - **Reduces erosion**
    - **Facilitates coloniztion by benthic algae and invertebrates**
    - **Shelter and support**
    - **Enriched oxygen supply**
    - **Nutrient buffer**

References:

Korschgen, Carl E. and William L. Green. 1988. American wildcelery (*Vallisneria americana*): Ecological considerations for restoration. U.S. Fish and Wildlife Service, Fish and Wildlife Technical Report 19. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. http://www.npwrc.usgs.gov/resource/literatr/wildcel/wildcel.htm (Version 16JUL97).